

a strip interposed between a face of the magnet and a first portion of at least one of the grooves, the strip being produced from a material which is less hard than the magnet.

2. (Amended) The alternator as claimed in claim 1, wherein the strip is interposed between the magnet and the first portion of each of the grooves.

3. (Two Times Amended) The alternator as claimed in claim 1 wherein the strip covers a circumferential face of the magnet.

4. The alternator as claimed in claim 3, wherein the circumferential face is oriented in a direction opposite to a shaft of the alternator.

5. (Amended) The alternator as claimed in claim 1, which comprises two strips interposed between respective opposed faces of the magnet and the first portion and a second portion respectively of at least one of the grooves.

6. The alternator as claimed in claim 1, wherein the groove profile of each groove is "U"-shaped.

7. (Two Times Amended) The alternator as claimed in claim 1, wherein the groove profile of each groove is "V"-shaped, the "V"-shaped groove profile having a first branch which is locally parallel to a circumferential face of the poles.

8. (Two Times Amended) The alternator as claimed in claim 7, wherein the "V"-shaped groove profile has two branches, the first branch closer to a shaft of the alternator than the other branch.

9. The alternator as claimed in claim 1, further comprising a layer of adhesive which is more flexible than the magnet and is interposed between the strip and the magnet.

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10. The alternator as claimed in claim 9, wherein the magnet includes two separate parts bonded to one another by a layer of material which is more flexible than the magnet.

11. The alternator as claimed in claim 10, wherein the material is identical to the adhesive.

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12. (Amended) The alternator as claimed in claim 1, which comprises a plurality of magnets and a plurality of strips, at least two of the magnets being associated with respective strips.

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13. The alternator as claimed in claim 12, wherein a majority of the magnets are associated with respective strips.

14. (Amended) The alternator as claimed in claim 12, wherein the strips comprise parts that are independent of one another.

15. The alternator as claimed in claim 1, wherein the strip comprises glass fiber embedded in pre-impregnated plastic.

16. (Amended) An alternator for a vehicle, the alternator comprising:

a magnet;

two pole pieces having interlaced poles, the poles having grooves profiled along an axis, the magnet interposed in the grooves and between interlaced poles, the groove profile preventing the magnet from escaping the grooves in a plane perpendicular to the axis; and

a first strip of material less hard than the magnet, the first strip interposed between the magnet and a first portion of at least one of the grooves.

17. (Amended) The alternator of claim 16 wherein the first strip is interposed between the magnet and the first portion of each of the grooves.

18. The alternator of claim 16 wherein the first strip covers a circumferential face of the magnet.

19. The alternator of claim 18 wherein the circumferential face is oriented in a direction opposite to a shaft of the alternator.

20. (Amended) The alternator of claim 16 further comprising a second strip of material, the first strip and the second strip interposed between respective opposed faces of the magnet and the first portion and a second portion respectively of at least one of the grooves.

21. The alternator of claim 16 wherein each groove is "U"-shaped.

22. (Amended) The alternator of claim 16 wherein each groove is "V"-shaped, with a first branch of each "V"-shaped groove locally parallel to a circumferential face of the poles.

23. (Amended) The alternator of claim 22 wherein the first branch is closer to a shaft of the alternator than the other branch of the "V"-shaped groove.

24. The alternator of claim 16 further comprising a layer of adhesive more flexible than the magnet, the layer of adhesive interposed between the first strip and the magnet.

25. The alternator of claim 24 wherein the magnet includes two separate magnet portions bonded to one another by a layer of material more flexible than each of the magnet portions.

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26. The alternator of claim 25 wherein the material of the layer is identical to the adhesive.

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27. (Amended) The alternator of claim 16 comprising a plurality of magnets and a plurality of strips, at least two of the magnets being associated with respective ones of the strips.

28. (Amended) The alternator of claim 27 wherein the respective strips comprise parts that are independent of each other.

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29. The alternator of claim 16 wherein the first strip comprises glass fiber embedded in pre-impregnated plastic.

30. (Amended) An alternator for a vehicle, the alternator comprising:

a magnet;

two pole pieces having interlaced poles, the poles having grooves profiled along an axis, the magnet interposed in the grooves and between interlaced poles, the groove profile preventing the magnet from escaping the grooves in a plane perpendicular to the axis;

a strip of material less hard than the magnet, the strip interposed between the magnet and a portion of at least one of the grooves, the strip covering a circumferential face of the magnet oriented in a direction opposite to a shaft of the alternator; and

a layer of adhesive more flexible than the magnet, the layer of adhesive interposed between the strip and the magnet.

REMARKS

Claims 1-30 are pending.

Claims 1-30 were rejected.

Claims 1, 2, 3, 5, 7, 8, 12, 14, 16, 17, 20, 22, 23, 27, 28 and 30 are amended herein.

Claims 1, 16 and 30 are independent claims.

Rejections Under 35 U.S.C. § 112

Claims 1-14 were rejected under 35 U.S.C. § 112 ¶ 2 as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. With respect to Claim 1, the Office Action alleges that "the strip being produced from a material less hard than the magnet" is indefinite because metes and bounds for the limitation are not clearly recited.

The Applicant respectfully requests withdrawal of this rejection. The Applicant submits that the Office Action fails to set forth a prima facie case of indefiniteness and improperly associates claim breadth with claim indefiniteness.

The "focus during examination of claims for compliance with the requirements for definiteness ... is whether the claim meets the threshold requirements for clarity and precision, not whether more suitable language or modes of expression are available." Manual of Patent Examining Procedure § 2173.02 (7th ed. 1997). Definiteness is analyzed in light of 1) the content of the patent application disclosure, 2) the claim interpretation that would be given by one of ordinary skill in art at the time the invention was made, and 3) the teachings of the prior art. *In re Wiggins*, 488 F.2d 538, 179 U.S.P.Q. 421, 423-24 (C.C.P.A. 1973). Accordingly, Claims 1-14 are definite under Section 112, second paragraph.

First, the Office Action fails to provide sufficient reasoning as to why the claims are unclear when read in light of the specification. The claims and the specification clearly state that the strip is produced from a material that is less hard than the magnet. As an example, the specification recites that the strip is glass fiber embedded in a pre-impregnated plastic. See page 5, line 28-32. The definiteness of the language employed must be analyzed not in a vacuum, but in light of the teachings of the prior art and of the application disclosure as it would be interpreted by one of ordinary skill in the art. *In re Angstadt*, 537 F.2d 498, 190 U.S.P.Q. 214, 217 (C.C.P.A. 1976). The cited claim language, a strip comprising material less hard than the magnet, is clear in light of the specification.

Second, the claim language is clear to one skilled in the art of the invention. The Applicant submit that a magnet is well know as a mass of material that has the properties of attracting iron and producing a magnet field external to itself. Once a magnetic material has been selected for use in the inductor of the claimed invention, one skilled in the art can easily, clearly and precisely select a material for the strip that is less hard than the chosen magnetic

material. Conversely, once strip material has been selected, one skilled in the art can easily, clearly and precisely select a magnetic material for the magnet that is harder than the chosen strip material. For example, Irie et al (US 5,973,435) discloses that a ferrite magnet, neodymium magnet or rare earth magnet may be utilized in an inductor. The hardness of these types of magnets and other materials is generally disclosed in reference books. For example, American Society for Metals, Metals Handbook, 785-97 (Taylor Lyman ed., 8th ed., 1961) discloses the Rockwell hardness of various magnetic materials (see Appendix 1, tables of page 789). The Applicant submits that one skilled in the art can easily select a strip material that is less hard than any chosen magnetic material.

Third, the claim language is reasonably defined. The specification clearly states that the flexibility of the strip takes up play due to manufacturing tolerances in a direction radial to the axis of the rotor of the inductor, thereby providing a damping effect. Specification at page 6, line 10-16. It is for this reason that the strip is formed from a material that is less hard than the magnet. See page 5, line 28-32. The claims read in light of the specification, reasonably apprise those skilled in the art of the use and scope of the invention and the language utilized is as precise as the subject matter permits. *Shatterproof Glass Corp v. Libbey-Owens Ford Co.*, 758 F.2d 613, 624, 225 U.S.P.Q. 634, 641 (Fed. Cir.), *cert. dismissed*, 474 U.S. 976 (1985). Accordingly, Claim 1 and dependent Claims 2-14 are definite under Section 112, second paragraph.

Further, the breadth of these claims should not to be equated with indefiniteness. *In re Rasmussen*, 650 F.2d 1212, 1215, 211 U.S.P.Q. 323, 326 (C.C.P.A. 1981). The Office Action questions whether the strip is metallic or nonmetallic, magnetic or nonmagnetic. These questions are not material to the determination of whether the claim language is clear and precise. The claim language clearly and precisely requires only that the claimed inductor of the invention include, in part, a strip of material less hard than the magnet. Thus, whether the strip of the claimed inductor is metallic or nonmetallic, magnetic or nonmagnetic in various embodiments of the invention is not an essential to the claimed invention.

The Applicant is entitled to claims as broad as the prior art and the Applicant's disclosure will allow. *Id.* Thus, the Applicant respectfully submits that the claims comply with Section 112, second paragraph because the scope of the subject matter embraced by the claims is clear and has not been indicated to be different from that defined in the claims.

With respect to Claims 12 and 27, the Office Action alleges that the recitation of “at least two of the magnets being associated with respective strips” is indefinite because the independent claim from which these claims depend recites only a singular strip.

Claim 12 and 27 have been amended to provide clear antecedent basis and make positive recitation of the claimed subject matter. Specifically, Claims 12 and 27 have been amended to recite “the alternator ... comprising a plurality of magnets and a plurality of strips, at least two of the magnets being associated with respective strips.” Support for the amendment is found throughout the specification, in particularly, at page 5, line 29-35.

Rejection Under 35 U.S.C. § 103(a)

Claims 1-4, 12-19 and 27-29 were rejected under 35 U.S.C. § 103(b) as being unpatentable over XP-000726444 (hereinafter “XP’444”) in view of Ragaly (EP 0837-538-A)

The Office Action asserts that XP’444 discloses an alternator comprising two claw poles interlacing, the claw poles having a groove that accommodates at least one magnet. Further, the Office Action asserts that Ragaly discloses an alternator having magnets embedded into the pole piece, wherein the claw pole’s groove accommodates at least one magnet, and a strip interposed between one face of the magnet and the groove, wherein the [s]trip covers the magnet’s circumferential face that is oriented in a direction opposite to the alternator’s shaft.

Thus, the Office Action concludes that it would have been an obvious matter of design choice to modify the XP’444 by providing a [s]trip interposed between one face of the magnet and the groove, as allegedly taught by Ragaly, because this would provide a means to firmly restrain the magnets in position against the centrifugal force. The Office Action further concludes that it would have been obvious to one having ordinary skill in the art to select glass fiber embedded in impregnated plastic for the strip since it is within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

The Applicant respectfully submits that claim 1 is patentable because XP’444 and Ragaly individually and collectively fail to teach interlaced poles including grooves accommodating a magnet and a strip of material less hard than the magnet interposed between a face of the magnet and a first portion of at least one of the grooves.

First, the Applicant submits that the Examiner has failed to carry his burden of establishing a prima facie case of obviousness. M.P.E.P. § 2142-43. The Applicant respectfully submits that there is neither the disclosure nor the suggestion in XP'444 or Ragaly to utilize a strip of material less hard than the magnet interposed between a face of the magnet and a first portion of at least one of the grooves. In addition, neither XP'444 or Ragaly disclose, suggest, or provide the motivation, individually or in combination, to one skilled in the art to combine the cited references in the manner suggested by the Office Action.

The Applicant also respectfully submits that the Office Action has not identified the reasons that a person of ordinary skill would combine the cited references to address the problems identified in the instant invention. Without this reason or suggestion, the Office Action improperly uses hindsight. Accordingly, the Applicant respectfully submits that Claim 1 is patentable over the prior art of record and requests reconsideration of Claim 1.

Furthermore, even if the references were combined, they still fail to teach each element of Claim 1 as discussed below. Specifically, amended Claim 1 recites an inductor comprising two pole pieces having interlaced poles; a magnet, the poles including grooves profiled along an axis, the grooves accommodating the magnet between the interlaced poles of the pole pieces, the groove profile completely preventing the magnet escaping from the grooves in a plane perpendicular to the axis; and a strip interposed between a face of the magnet and a first portion of at least one of the grooves, the strip being produced from a material which is less hard than the magnet. No new matter is added by this amendment, which is made to substitute an equivalent term and more appropriately describe the location of the strip. Support is found in the specification at page 5, line 32-35.

XP'444 fails to teach Claim 1 as XP'444 does not disclose a strip interposed between a face of the magnet and the groove. XP'444 merely states that to relieve stress on the magnets disposed between claw pole fingers, each magnet is divided in two equal sections that are glued or otherwise affixed to the surface of a claw finger while having common surfaces that are free to slide past each other. Moreover, the text of XP'444 fails to disclose that there is a groove in the claw pole fingers. Further, XP'444 fails to disclose or suggest that a strip be interposed between a face of the magnet and the groove to take up play due to manufacturing tolerances and deformation due to forces and heating caused by the rotation of the rotor. This disclosure sharply contrasts with the Applicant's Claim 1, which recites a strip of material less hard than the

magnet of an inductor interposed between a face of the magnet and the groove to provide cushioning and reduce breakage of the magnet.

The Office Action acknowledges that XP'444 does not disclose a strip interposed between a face of the magnet and the groove. However, Ragaly, which the Office Action alleges discloses a strip interposed between one face of the magnet and the groove, wherein the strip covers over the magnet's circumferential face that is oriented in a direction opposite to the alternator's shaft, fails to correct the deficiency acknowledged by the Office Action.

Ragaly discloses a generator with claw type magnet poles (17) attached to a disk-shaped plate (15) with permanent magnetic parts (27) provided between adjacent magnetic poles (17). The plate (15) has a groove extending between the magnet poles and the longitudinal direction of the drive shaft (5) and the magnetic parts (27) have a cut out section that corresponds to the shape of the grooves for attachment. The undercut of the poles secures the magnet and serves to take up the centrifugal forces caused by high rotation speed. Ragaly also discloses in Figure 2c an arc shaped segment of ferromagnetic material that extends over the groove and groove opening and the magnet to further secure and stabilize the magnet. However, Ragaly fails to teach Claim 1. Specifically, Ragaly does not disclose that the strip interposed between a face of the magnet and the groove be formed of a material that is less hard than the magnet. Ragaly merely states that the strip is a magnetic material that firmly restrains the magnets in position against centrifugal force.

In sharp contrast, Claim 1 recites an inductor with a magnet; interlaced poles including grooves profiled along an axis to accommodate the magnet between the interlaced poles, the groove profile completely preventing the magnet escaping from the grooves in a plane perpendicular to the axis; and a strip of material less hard than the magnet interposed between a face of the magnet and a first portion of at least one of the grooves. A person of ordinary skill in the art, interested in providing an inductor with reduced magnet breakage due to a strip interposed between the magnet and a portion of the grooves profiled along an axis on interlaced poles that is less hard than the magnets would not consider the Ragaly reference in solving the problem. The Office Action has failed to provide any disclosure teaching a strip less hard than the magnet interposed between the magnet and the groove. Accordingly, the Applicant respectfully request withdrawal of the rejection and allowance of Claim 1.

Claims 2-4 and 12-15 depend from independent Claim 1. As independent Claim 1 is believed patentable, dependent Claims 2-4 and 12-15 are also believed patentable based on such dependency as well as further limitation contained therein.

Claim 16 has been amended in a manner similar to Claim 1 to recite that the strip is interposed between the magnet a first portion of a groove. For Claim 16, the Applicant respectfully submits that there is neither the disclosure nor the suggestion in XP'444 or Ragaly to interpose a strip between the magnet a first portion of a groove, the strip being less hard than the magnet. Furthermore, even if combined, the references still fail to teach each element of Claim 16, specifically a strip interposed between the magnet a first portion of a groove, the strip being less hard than the magnet. Accordingly, Claim 16 is believed to patentable over the prior art of record.

Claims 17-19 and 27-29 depend from independent Claim 16. As independent Claim 16 is believed patentable, dependent Claims 17-19 and 27-29 are also believed patentable based on such dependency as well as further limitation contained therein.

Claims 5-8 and 20-23 were rejected under 35 U.S.C. § 103(b) as being unpatentable over XP'444 and Ragaly in view of the ordinary skill of a worker in the art. The Office Action asserts that XP'444 and Ragaly disclose the claimed invention, except for the added limitations of two strips interposed opposite surfaces of the magnet, or the groove U-shaped, or the groove V-shaped. The Office Action states that a second strip merely duplicates a disclosed element of the device and that the shape of the groove is a matter of design choice. Thus, the Offices Action asserts that two strips, interposed opposite surfaces of the magnet, a U-shape and V-shape profile are obvious variations to one having skill in the art.

As Claims 5-8 and 20-23 depend from independent Claims 1 and 16, respectively, dependent Claims 17-19 and 27-29 are believed patentable based on such dependency as well as further limitation contained therein.

Claims 9, 24 and 30 were rejected under 35 U.S.C. § 103(b) as being unpatentable over XP'444 and Ragaly in view of Yamada et al. (US 5,734,216). The Office Action asserts that XP'444 and Ragaly disclose the claimed invention, except for the added limitation of a layer of adhesive between the strip and the magnet, allegedly disclosed by Yamada et al..

As Claims 9 and 24 depend from independent Claims 1 and 16, respectively, dependent Claims 9 and 24 are believed patentable based on such dependency as well as additional

limitation contained therein. Further, the Office Action's reading of Yamada's magnet rotor in which a yoke magnet is surrounded by a cylindrical permanent magnet with adhesive filling the clearance therebetween is not well taken. The yoke is not equivalent to the strip of Applicant's Claim 1, the strip of Applicant's claimed invention taking up deformations due to rotational and heat expansion forces. While containing additional limitations, independent Claim 30 is analogous to independent Claim 1 and 16. Accordingly, Claim 30 is believed to be patentable for the same reasons stated above with respect to Claims 1 and 16. In particular, neither XP'444 nor Ragaly disclose or suggest to interpose a strip between the magnet a first portion of a groove, the strip being less hard than the magnet. Furthermore, even if combined, the references still fail to teach each element of Claims, specifically a strip interposed between the magnet a first portion of a groove, the strip being less hard than the magnet.

Claims 10-11 and 25-26 were rejected under 35 U.S.C. § 103(b) as being unpatentable over XP'444 and Ragaly in view of Mitcham et al. (US 5,877,578), which is alleged to teach a permanent magnet comprising a plurality of separate magnet parts that are bonded together. The Office Action asserts such a combination to be obvious to one having skill in the art as XP'444 and Ragaly allegedly disclose the claimed invention, except for the added limitation of the magnet including two separate parts bonded together by a layer of adhesive material.

With respect to Claims 10-11 and 25-26, each claim depends from and includes all the limitations of Claim 1 and 16 respectively, which, are believed to be allowable over the prior art. Accordingly, Claims 10-11 and 25-26 should also be allowable based on their dependency therefrom as well as other novel subject matter included therein.

Reference Citation Requested

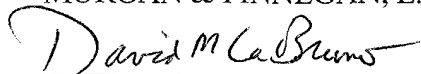
The Applicant noted in the previous Amendment that the Irie et al reference (US 5,973,435) was not listed on the signed Notice of References Cited, PTO-892, attached with the Office Action dated 6/7/00, paper 4. The Irie et al. reference also is not indicated on the signed PTO-1449 originally submitted to the USPTO and returned with the Office Action dated 6/7/00. Accordingly, the Applicant respectfully requests issuance of a supplemental PTO-892 indicating examination this application with respect to the Irie et al. reference.

Conclusion

Based on the foregoing remarks, it is respectfully submitted that all of the claims as currently pending are patentable and in condition for allowance. Reconsideration of the application and withdrawal of the rejections are respectfully requested.

In the event that a telephone conference would facilitate examination in any way, the Examiner is invited to contact the undersigned representative at the number provided.

Respectfully submitted,
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